

CLAIM REJECTION - 35 U.S.C. 102 § (B)

With respect to section 2 of the Office Action, the Examiner rejected claims 5, 8, 9 and 17 under 35 U.S.C. § 102(b) as being anticipated by Shimada et al. (U.S. Patent No. 5,838,064). Of the rejected claims, only Claims 5 and 17 are independent.

Applicant respectfully traverses these rejections.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). **"The identical invention must be shown in as complete detail as is contained in the ... claim."** *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). (MPEP §2131)

With particular reference to Shimada et al (U.S. 5,838,064), the purpose of the prior art is related to an electronic package including a supporting member, an electronic device, a carrier, a substrate and a cooling means. The supporting member includes a plate and a bottom leg for supporting the plate. A first end of the bottom leg is joined to the lower surface of the plate. The carrier has a hole for receiving the bottom leg. The electronic device is connected to the carrier and is attached to the lower surface of the plate. A second end of the bottom leg is inserted into the hole of the carrier. The second end of the bottom leg is joined to the upper surface of the substrate. The electronic device is positioned between the plate of the supporting member and the substrate. The cooling means is attached onto and supported by the upper surface of the plate. Shimada fails to teach not only the stabilization plate set around the thermal pad for making the thermal pad closely contact the die of the chip but also the heatsink comprising a right portion and a left portion respectively having a first plurality of cooling fins and a second plurality of cooling fins, of which the second cooling fins are fewer in number than the first cooling fins, as does the present invention.

The Examiner asserts that the Shimada discloses all features disclosed in claims 5, 8, 9 and 17 of the present application in figure 3. In fact, with reference to Fig. 3 of Shimada, a plate 12 serves as a heat sink or a heat radiating plate. The plate 12 has four bottom legs 11, one at each corner of its lower surface. The plate 12 also has four upper legs 13, one at each corner of its upper surface (Shimada, Col. 4, lines 39-42). A heat sink 43 is attached to the upper face of the plate 12. The upper legs 13 are inserted into holes 431 bored in the heat sink 43 (Shimada, Col. 6, lines 12-15). The upper surface of the LSI chip 40 is attached (e.g., glued) to the lower face of the plate 12 of the supporting member 10 by an adhesive 44 (Shimada, Col. 5, lines 61-64). Shimada only discloses a heat sink 43 on a plate 12, the plate 12 on a chip 40 and an adhesive 44 between chip 40 and plate 12 for adhesion. **Shimada fails to disclose that the plate (12) is set around the adhesive (44) to make the adhesive (44) closely contact the die of the chip (40); in fact, the plate (12) is just set on the adhesive (44).** Therefore, following the stipulation of 35 U.S.C. 102(b), the claim 17 satisfies the requirements for novelty.

With continued reference to Fig. 3 of Shimada, the fins on the heat sink are separated into three regions by two nuts 47. The fins on the left region are the same in number as the fins on the right region. **Shimada thus also fails to disclose a right portion and a left portion respectively having a first plurality of cooling fins and a second plurality of cooling fins, with the second cooling fins being fewer in number than the first cooling fins.**

Beside, the support plate 12 disclosed by Shimada is a rigid structure, not an elastic structure. The support plate 12 is made of copper-tungsten alloy, a material having thermal conductivity (Shimada, Col. 4, lines 44-46). The support plate 12 disclosed by Shimada cannot be a buffer between the chip 40 and heat sink 43. The stabilization plate disclosed in the present application is made of PORON, a quite soft, elastic material and a bad thermal conductor. The respective materials and functions of the stabilization (support) plates disclosed by the present application and Shimada are both different. Therefore, following the stipulation of 35 U.S.C. 102(b), claim 5 is novel.

Accordingly, Applicant submits that independent Claims 5 and 17 are

allowable over the art of record and respectfully requests reconsideration and withdrawal of the 35 U.S.C. § 102 (b) rejection of Claims 5 and 17. In addition, insofar as claims 8 and 9 depend from independent Claim 5 and add further limitations thereto, Applicant requests that the 35 U.S.C. § 102 (b) rejection of these claims be withdrawn as well.

Reconsideration and withdrawal of these rejections are respectfully requested.

CLAIM REJECTION - 35 U.S.C. § 103

With respect to section 3 of the Office Action, the Examiner rejected Claims 1, 2, 10, 15 and 16 under 35 U.S.C. § 103 (a) as being unpatentable over Shimada et al. (U.S. Patent No. 5,838,064) in view of Glenn et al. (U.S. Patent No. 5,596,485) and claims 4 and 11 under 35 U.S.C. § 103 (a) as being unpatentable over Shimada et al. (U.S. Patent No. 5,838,064) in view of Feingerg et al. (U.S. Patent No. 5,060,114). Of the rejected claims, only Claim 1 is independent.

Applicant respectfully traverses these rejections.

This application discloses a heatsink assembly having stabilization plate. The stabilization plate, such as an n-shaped PORON slice, is disposed under a heatsink, and is surrounding a thermal pad under the heatsink. **By the stabilization of the stabilization plate, the heat sink is stably fastened on the die.** If the stabilization plate has a thickness approximately equal to or larger than that of the die, note that a fastening force from the clip should be considered, and the stabilization plate will be too thick to provide a stable contact of the thermal pad onto the die. Therefore, **the preferable thickness of the stabilization plate is less than that of the die.**

Glenn discloses a heat spreader with one or more integrally formed open regions to discourage the formation of air bubbles in the encapsulant of a plastic packaged integrated circuit. The heat spreader is positioned on the chip and is supported by a plastic over-mold 206 (Fig. 2) or an insulation layer 106 (Fig. 1A). There is a cavity 116, 216, 316, 416 and 516 formed by a plastic over-mold 206 (Fig. 2) or an insulation layer 106 (Fig. 1A). The chip 114 and 314 are both thinner than the

supports, plastic over-mold 206 or insulation layer 106 (Figs. 1A, 2, 3 and 6). At all times Glenn describes the supports as being thicker than the chip; otherwise, the heat spreader could not be supported by the supports and there would be no place to put the bonding wire. **Glenn thus fails to disclose a stabilization plate (12) that has a thickness less than that of the die.**

Glenn fails to disclose that the **stabilization plate** can be made with any dimensions desired, and merely discloses that "**Heat spreader 400 can be made to any dimensions desired**" (Glenn et al., Col. 5, line 28). Applicant respectfully submits that Glenn's feature regarding the heat spreader 400 has been misread and thus misapplied to Applicant's stabilization plate. Since Shimada fails to disclose that the stabilization plate is set around the thermal pad and Glenn fails to disclose a stabilization plate that has a smaller thickness than the die, Shimada and Glenn together fail to teach, suggest, or otherwise render obvious the same features as the present invention. The claimed invention thus proposes a heatsink assembly having stabilization plate that cannot be obtained by combining the two inventions of Shimada and Glenn and thus is patentably distinct over Shimada in view of Glenn.

Accordingly, Applicant submits that independent Claim 1 is allowable over the art of record and respectfully requests reconsideration and withdrawal of the 35 U.S.C. § 103 (a) rejection of Claim 1. In addition, insofar as claims 2, 4, 10, 11, 15 and 16 depend from independent Claims 1 and 5 and add further limitations thereto, Applicant respectfully requests withdrawal of the 35 U.S.C. § 103 (a) rejection of these claims as well.

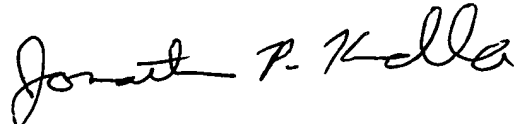
Applicant respectfully submits that all claims in the present application are now in condition for allowance. Early and favorable indication of allowance is courteously solicited.

CONCLUSION

For all of the above reasons, Applicant submits that the specification and claims are now in proper form, and that the claims define patentably over the prior art. Therefore applicants respectfully request the Examiner issue this case at his earliest convenience.

Respectfully submitted,

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